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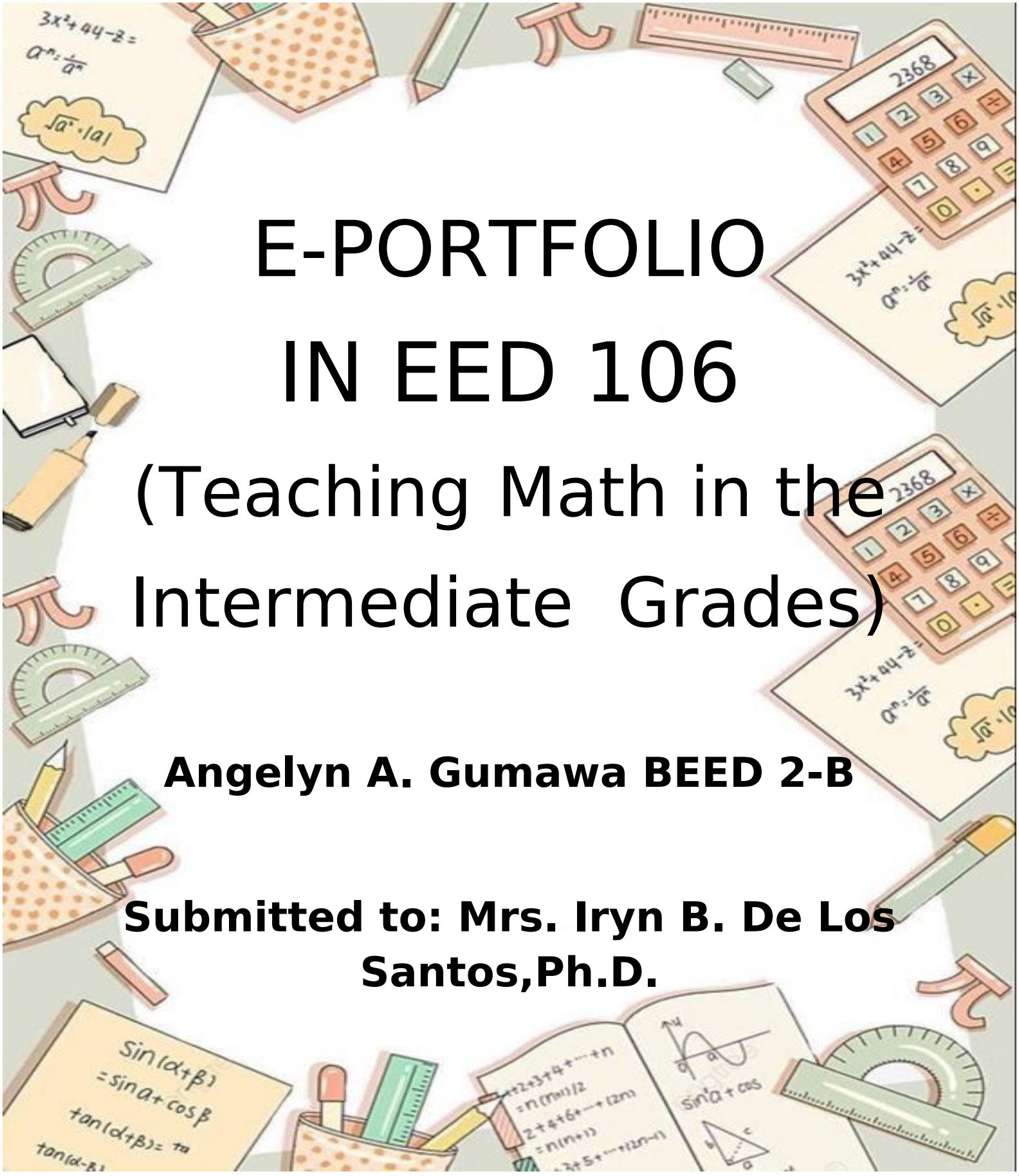
ILOILO SCIENCE AND TECHNOLOGY UNIVERSITY
LA PAZ, ILOILO CITY



E-PORTFOLIO IN EED 106 (Teaching Math in the Intermediate Grades)

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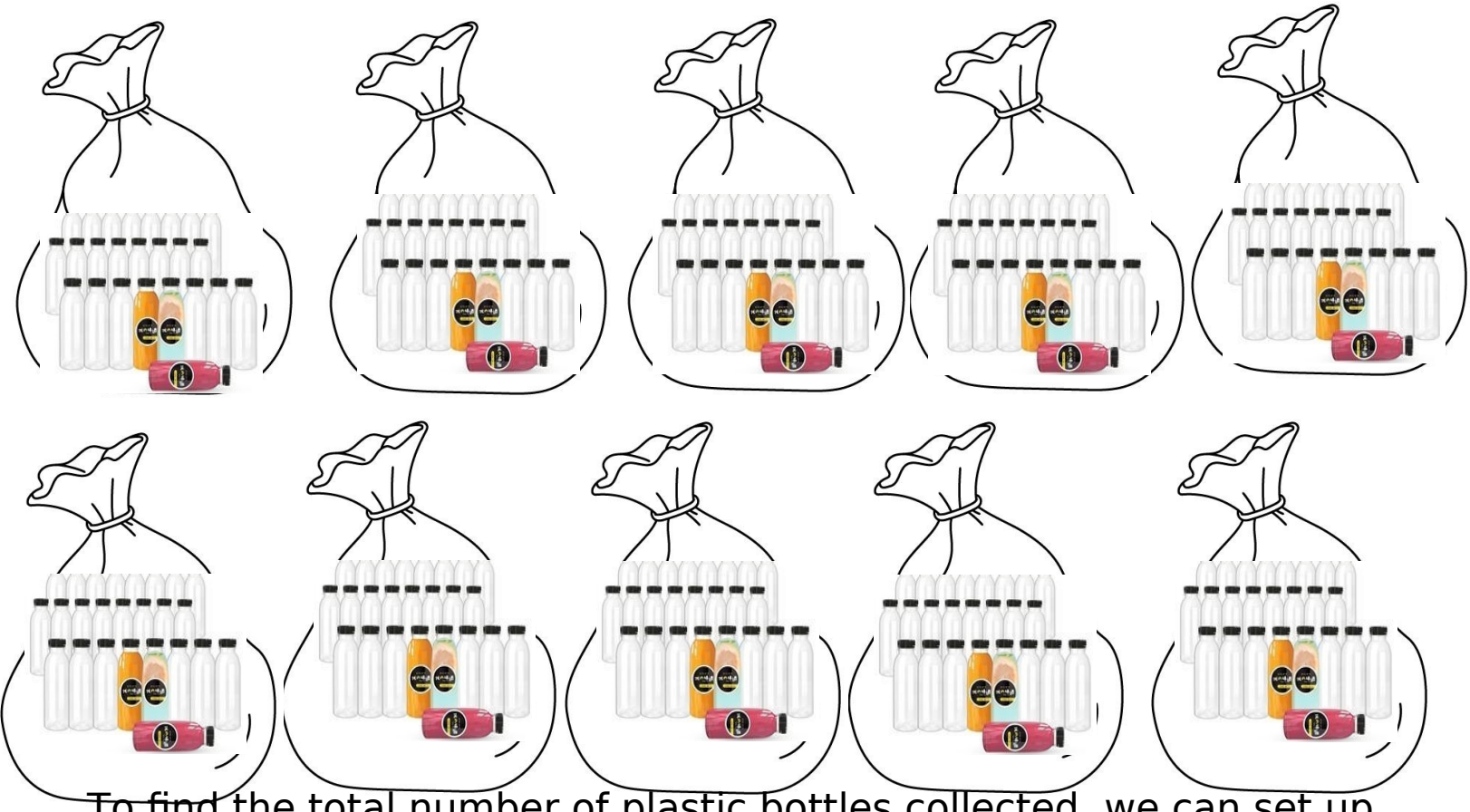
MODULE 2

WHOLE NUMBERS

LESSON 1: Multi-Digit Multiplication

A group of high school students collects plastic bottles for their school project. They collected a total of 10 sacks full of plastic bottles. If each sack contains 25 plastic bottles, how many plastic bottles did the group of high school students collect?

To visualize the problem, each sack contains 25 plastic bottles.



To find the total number of plastic bottles collected, we can set up the multiplication sentence as follows: 25 plastic bottles x 10 sacks = Total number of plastic bottles.

Thus, A group of high school students collected 25x10= **250 plastic bottles in total**.

To use the vertical multiplication method:

```
 25
x 10
```

Step 1: Multiply the ones place of the multiplicand by the ones place of the multiplier.

```
  25
 x 10
------
    0
```

Step 2: Multiply the tens place of the multiplicand by the ones place of the multiplier.

```
  25
 x 10
------
  0 0
```

Step 3: Multiply the ones place of the multiplicand by the tens place of the multiplier.

```
    25
  x 10
------
  0 0
  5
```

Step 4: Multiply the tens place of the multiplicand by the tens place of the multiplier.

```
    25
  x 10
------
  0 0
 2 5
```

Step 5: Add the partial products.

```
    25
  x 10
------
  0 0
+ 2 5
------
```

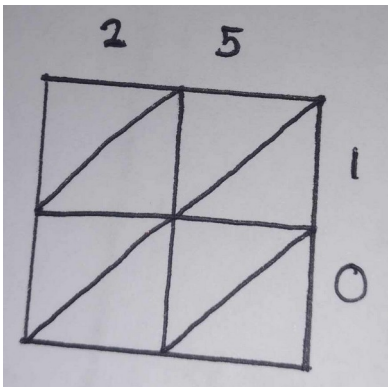
Thus, the total number of plastic bottles that a group of high school students collected for their project 250 plastic bottles.

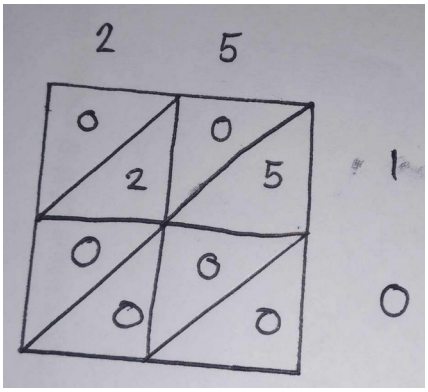
250

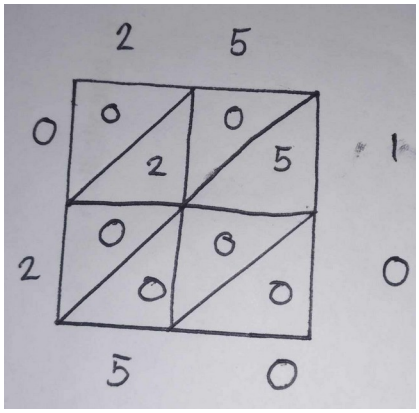
Lattice Method:

Multiply 25 by 10 using the lattice method.

Step 1: Prepare Step 2: Multiply Step 3: Add







Therefore, the answer in 25x 10 is **250**.

Distributive Property of Multiplication over Addition (DPMA)

Our number sentence is 613 x 72 = N.

We can rewrite 72 as 70+ 2.

So, our new equation is 613 x (70 + 2) = N

Now, let's work through the equation:

(613 x 70) + (613 x 2)

42,910 + 1, 226

=44,136

Lesson 2: Division of 3-to 4 – Digit Numbers by 1-to 2- Digit Numbers

Jennie bought a pack of candies for her 6 cousins. A pack contains 48 candies, If Jennie will distribute the candies to her cousins equally, how many candies can each of her cousins get?

48 is the ***dividend*** or the number to be divided by another number while 6 is the ***divisor***, which divides another number. N represents the quotient or the answer in division.

To get the quotient we need to follow these steps:

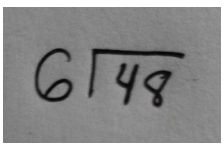
Given:

Number of candies= 48

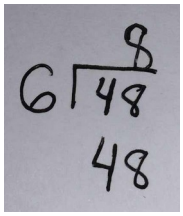
Cousins = 6

Number of candies ÷ cousins= total number of candies given to each cousins

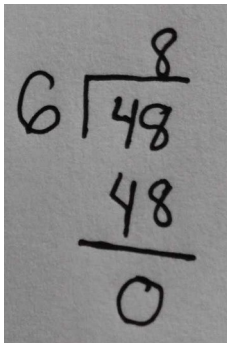
STEP 1: Divide



STEP 2: Multiply



STEP 3: Subtract



EXAMPLE 2:

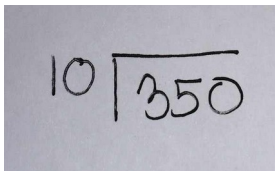
A customer of Divine ordered 350 pieces of puto to be distributed in an event in school. If Divine will put 10 pieces of puto in a styro tray, how many styro tray will Divine need?

GIVEN: 350- pieces of puto ordered by Divine's customer

10- puto per styro tray

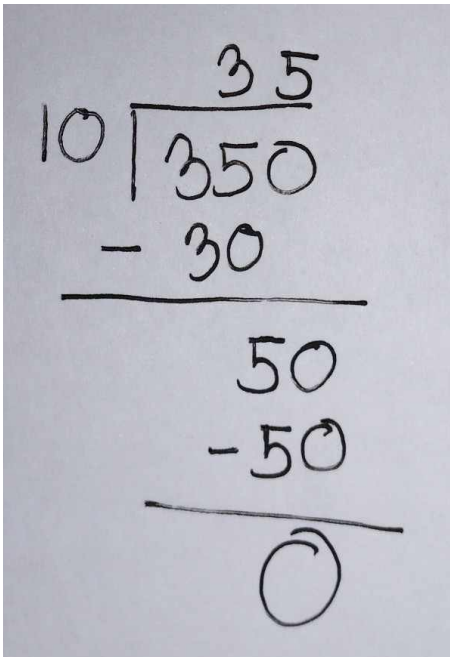
Pieces of puto ordered by Divine's customer ÷ puto per styro tray= total number of styro tray Divine will need.

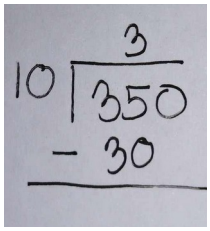
Step 1: Divide



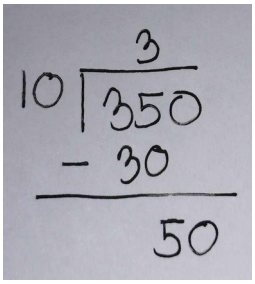
Step 2: Multiply

Step 4: Bring Down and repeat the process





Step 3: Subtract



Thus, Divine will need 35 styro tray.

Lesson 3: Order of Operations

Grouping symbols

Exponents

Multiplication

Division

Addition

Subtraction

Example 1: Evaluate the expression: $9+4\times(8-6)\div2$

Solution:

Step 1: First, we perform the operations inside the parentheses (brackets).

$8-6=2$

Step 2: Next, we perform the multiplication operation.

$4\times2=8$

Step 3: Then, we perform the division operation.

$8 \div 2 = 4$

Step 4: Finally, we perform the addition operation.

$9 + 4 = 13$

So, $9 + 4 \times (8 - 6) \div 2 = 13$.

EXAMPLE 2:

Yunjin wants to go to her dream concert of her favourite K-pop group and she plans to purchase a VIP standing that costs P12,000.00. She has saved 6,000.00 so far and plan to save P500.00 every week. How many weeks will it take for Yunjin to save enough money to purchase a VIP standing?

(P12,000- P6,000) ÷ P500= N

P6,000÷P500= N

12=N

Therefore, it will take Yunjin **12 weeks** to save money for her to be able to purchase a VIP standing.

Lesson 4: Exponential Notation

Example 1:

There are 5^7 bottles of orange juice in a grocery store. How many bottles of orange juice are there?

What does 5^7 mean? 5^7 is an example of a number written in exponential notation. It is read as “5 to the seventh power”, “four to the seventh” or “5 raised to 7”.

5 is the base. It is a number that gets multiplied repeatedly a certain number of times. It is written in regular size.

7 is the exponent. The exponent tells the number of times the base is to be multiplied by itself. It is written smaller in the upper right of the base.

When written in expanded form, $5^7$is equal to 5x5x5x5x5x5x5. The standard form of 5^7 is 78,125.

Therefore, there are 78,125 bottles of orange juice in a grocery store.

The most common exponents which we always encounter are 2 and 3. They are read as “squared” and “cubed” respectively. Examples are the following:

EXPONENTIAL FORM	**READ AS**	**EXPANDED FORM**	**STANDARD FORM**
8^2	Eight squared	8x8	64
17^2	Seventeen squared	17x17	289
6^3	Six cubed	6x6	36
13^3	Thirteen cubed	13x13	169

EXAMPLE 2

10^6

10^6 tell us to multiply 10 by itself 6 times.

$10^{6=}$ 10x10x10x10x10x10= **1,000,000**

EXAMPLE 3

9^9

9^9 tell us to multiply 9 by itself 9 times.

$9^{9=}$ 9x9x9x9x9x9x9x9x9 = **387,420,489**

MODULE 3

NUMBER THEORY

Lesson 1: Prime and Composite Numbers

A number is called ***Prime*** if it has only two factors.

Examples:
a. 5 is the smallest prime number.It is only divisible by 1 and itself.

b. 7 is another prime number. It cannot be divided evenly by any other number except 1 and 7.

c. 31 is also a prime number. It is not divisible by any other number except 1 and 31.

On the other hand, numbers with more than two factors are called ***Composite***.

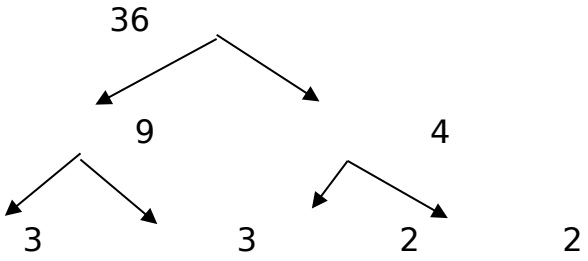
Examples:
a. 4 is a composite number because it can be divided evenly by 1,2, and 4.

b. 9 is also a composite number because it can be divided evenly by 1,3, and 9.

c. 15 is another example of a composite number as it can be divide evenly by 1,3,5, and 15.

Every composite number can be expressed as a product of its prime factors. This process is called **prime factorization**. For example, let us find the prime factorization of 36 using the Factor Tree Method. Let us then express the answer in exponential form.

example 1:

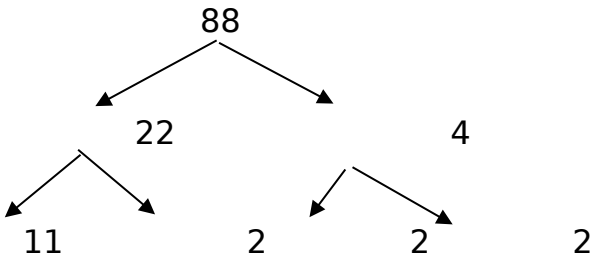


The prime factorization of 36 is 3 x 3 x 2 x 2 . To check if the prime factorization of a given number is correct, we ask ourselves two questions:

1. Are all factors prime already?
2. Is the product of the prime factors the same with the given number?

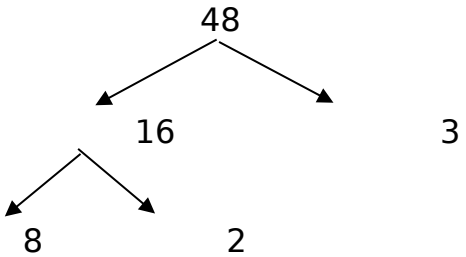
In our given number, the prime factors are 3 and 2 which are both primes. The product of 3 x 3 x 2 x 2 is 36. Therefore, our prime factorization of 36 is correct.

example 2:



In our given number, the prime factors are 11 and 2 which are both primes. The product of 11 x 2 x 2 x 2 or 11 x 2^3 is 88. Therefore, our prime factorization of 88 is correct.

example 3:



In our given number, the prime factors are 8,2, and 3 which are all primes. The product of 8 x 2 x 3 x 2 is 48. Therefore, our prime factorization of 48 is correct.